AMENDMENTS TO THE CLAIMS

For the Examiner's convenience, all pending claims are set forth below and have been amended where noted:

Claim 1. (original) A process for producing hydrogen, comprising:

catalytically reforming a first hydrocarbon portion with steam and air in an autothermal reactor to produce a first syngas effluent at a temperature from 650° to 1050°C;

supplying the first syngas effluent to a reforming exchanger;

passing a second hydrocarbon portion with steam through a catalyst zone in the reforming exchanger to form a second syngas effluent;

discharging the second syngas effluent from the catalyst zone adjacent the inlet to form a syngas admixture with the first syngas effluent;

passing the admixture across the catalyst zone in indirect heat exchange therewith to cool the admixture and heat the catalyst zone;

collecting the cooled admixture from an outlet of the reforming exchanger;

shift converting the admixture to obtain a carbon dioxide-rich gas stream lean in carbon monoxide; and

separating the carbon dioxide-rich gas stream to form a hydrogen-lean, mixed gas stream comprising nitrogen and carbon dioxide and a hydrogen-rich product stream.

Claim 2. (original) The process of claim 1, wherein the mixed gas separation comprises membrane separation.

Claim 3. (original) The process of claim 1, wherein the mixed gas separation comprises pressure swing adsorption.

Claim 4. (original) The process of claim 1, wherein the catalyst zone comprises catalyst tubes, the process further comprising:

supplying the first syngas effluent to a shell-side of the reformer;

supplying the second hydrocarbon portion with steam through the catalyst tubes;

discharging the second syngas effluent from the catalyst tubes adjacent the shell-side inlet to form the syngas admixture.

Claim 5. (original) The process of claim 1 wherein the autothermal reformer is operated with excess air.

Claim 6. (original) The process of claim 1 wherein the carbon dioxide-rich gas stream from the shift conversion comprises a molar ratio of hydrogen to nitrogen less than 3.

Claim 7. (original) The process of claim 1 wherein the mixed gas separation is free of cryogenic separation.

Claim 8. (original) The process of claim 1 wherein the process is free of air separation.

Claim 9. (original) The process of claim 1 wherein a proportion of the first hydrocarbon portion relative to a total of the first and second hydrocarbon portions is from 55 to 85 percent.

Claim 10. (original) The process of claim 1 wherein a proportion of the first hydrocarbon portion relative to a total of the first and second hydrocarbon portions is from 60 to 80 percent.

Claim 11. (original) The process of claim 1 wherein the hydrogen product stream has a purity of at least 70 volume percent.

Claim 12. (original) The process of claim 11, wherein the hydrogen product stream has a purity of from 90 to 99.5 volume percent.

Claim 13. (original) The process of claim 1, wherein the hydrogen product stream has a purity of at least 95 volume percent.

Claim 14. (original) The process of claim 1, wherein the hydrogen product stream has a purity of at least 97 volume percent.

Claim 15. (original) The process of claim 1, wherein the hydrogen product stream has a purity of at least 98.5 volume percent.

Claim 16. (original) A process for generating an electrical current comprising the process of claim 1 and supplying the hydrogen-rich product stream to a fuel cell.

Claim 17. (original) A hydrotreating process comprising the process of claim 1 and supplying the hydrogen-rich product stream to a hydrotreater.

Claim 18. (original) Apparatus for preparing syngas, comprising:

autothermal reactor means for catalytically reforming a first hydrocarbon portion with steam and air to produce a first syngas effluent at a temperature from 650° to 1050°C;

means for supplying the first syngas effluent to an inlet of a reforming exchanger;

means for passing a second hydrocarbon portion with steam through a catalyst zone in the reforming exchanger to form a second syngas effluent;

means for discharging the second syngas effluent from the catalyst zone adjacent the inlet to form a syngas admixture with the first syngas effluent;

means for passing the admixture across the catalyst zone in indirect heat exchange therewith to cool the admixture and heat the catalyst zone;

means for collecting the cooled admixture from an outlet from the reforming exchanger;

means for shift converting the admixture to obtain a carbon dioxide-rich gas

stream lean in carbon monoxide; and

means for separating the carbon-dioxide-rich gas stream to form a hydrogen-lean, mixed gas stream comprising nitrogen and carbon dioxide and a hydrogen-rich product stream.

Claim 19. (withdrawn) The apparatus of claim 18, wherein the separation means comprise a pressure swing adsorption unit.

Claim 20. (withdrawn) The apparatus of claim 18, wherein the separation means comprise a membrane separator.

Claim 21. (original) The process of claim 1, wherein the reforming, shift conversion and mixed gas separation comprise a process pressure from 10 to 200 bars.

Claim 22. (original) The process of claim 21, wherein the reforming, shift conversion and mixed gas separation comprise a process pressure of at least 30 bars.

Claim 23. (original) The process of claim 1, further comprising compressing air to the catalytic reforming with a gas turbine drive and recovering heat from exhaust from the gas turbine.

Applicant believes that no new matter has been added with these amendments.